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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,340	01/23/2007	Michael Anthony Wood	KPT 1100	4895
321 7590 09/08/2008 SENNIGER POWERS LLP 100 NORTH BROADWAY 17TH FLOOR ST LOUIS, MO 63102				
EXAMINER PUTTLITZ, KARL J				
ART UNIT		PAPER NUMBER		
1621				
NOTIFICATION DATE		DELIVERY MODE		
09/08/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

# Office Action Summary

**Application No.**

10/577,340

**Applicant(s)**

WOOD ET AL.

**Examiner**

KARL J. PUTTLITZ

**Art Unit**

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

The rejection under section 103 is withdrawn since Hara fails to teach or suggest the recited process with at least 1% water. The following is a new ground of rejection:

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hara (of record) in view of U.S. Patent No. 4,301,077 to Pesa et al. (Pesa).

As mentioned, Hara teaches method for producing 1,4-butanediol by hydrogenating succinic anhydride, succinic acid or  $\gamma$ -butyrolactone in the presence of a catalyst, wherein the hydrogenation reaction is conducted in a liquid phase using as the catalyst a ruthenium type catalyst comprising ruthenium, an organic phosphine and a phosphorus compound, see column 1, lines 52+.

The organic phosphine is considered to contribute to the control of the electron state of ruthenium as the main catalyst or to the stabilization of the active state of ruthenium. Specific examples of such an organic phosphine include a trialkylphosphine such as tri-n-octylphosphine, tri-n-butylphosphine or dimethyl-n-octylphosphine, a tricycloalkylphosphine such as tricyclohexylphosphine, a triarylphosphine such as triphenylphosphine, an alkylaryl phosphine such as dimethylphenylphosphine and a

polyfunctional phosphine such as 1,2-bis(diphenylphosphino)ethane, see column 2, lines 51+.

Hara also teaches that when succinic anhydride or succinic acid is used as the starting material, water will be formed as a byproduct, as the reaction proceeds. If the reaction is conducted while removing such byproduct water out of the reaction system by a reaction mode such as stripping, for example, by continuously circulating hydrogen in the reaction system, a further improved reaction activity can be attained. After completion of the reaction, desired 1,4-butanediol can be obtained from the reaction solution by a usual separating means such as distillation or extraction. The distillation residue can be recycled as a catalyst component to the reaction system, see column 4, line 54+.

The reaction temperature is usually from 50-250 C, and when the reaction is conducted on an industrial scale, the hydrogen pressure in the reaction system is usually from 0.1 to 200 kg/cm<sup>2</sup>, see column 4, lines 39+.

Although Hara fails to explicitly teach that about 1 mol to about 10 mol of hydrogen are used to strip 1 mole of product from the reactor. However, given the pressure ranges of hydrogen disclosed by Hara, those of ordinary skill would expect that the claimed molar ratio of hydrogen to product would be covered by the disclosed process, and thus, prima facie obvious.

Applicant argues that Hara fails to teach a reaction system having at least 1% water. It is for this proposition that the examiner joins Pesa, which also recognizes that water, see column 3, lines 26+. However, Pesa's reaction proceeds within the claimed

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amounts of water, see for example, see Ibid. Therefore, notwithstanding the fact that Pesa does not contain a phosphine-type catalyst, the patent recognizes that water is detrimental to hydrogenation catalysts, but still conducts the reaction in the claimed amounts of water. Thus, conducting the reaction within the claimed amounts of water is well within the purview of those of ordinary skill.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan, can be reached at telephone number (571) 272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Karl J. Puttlitz/

Primary Examiner, Art Unit 1621